REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1, 3-15, 17-31, 33-45, 47-50, and 52-54 are pending in the application, with claims 1, 9, 15, 23, 29, 31, 39, 45, and 50 being independent. Claims 2, 16, 32, 46, and 51 were previously canceled, and claims 6-8, 10, and 40 are canceled herein without prejudice to or disclaimer of the subject matter recited therein. Claims 1, 4, 9, 13-15, 17-24, 27-30, 31, 34, 36-39, 43-45, 48, and 50 are amended herein. Support for the claim amendments and additions can be found in the original disclosure. No new matter has been added.

DRAWING OBJECTIONS

The drawings stand objected to for failing to comply with 37 CFR 1.83(a). The methods of claims 9 and 39 are allegedly not shown in the drawings. Applicant amends claims 9 and 39 as presented above and every feature of the claims is shown in FIGS. 1-4. Accordingly, Applicant requests withdrawal of the drawing objections.

CLAIM OBJECTIONS

Claims 1, 4, 6, 9, 15, 17-24, 31, 34, 39, 45, and 50 stand objected to because of minor informalities in the claims. Claims 1, 4, 6, 9, 15, 17-24, 31, 34, 39, 45, and 50 are amended herein to address the informalities noted in the Office Action. Accordingly, Applicant requests withdrawal of the claim objections.

§ 112 FIRST PARAGRAPH REJECTIONS

Claims 1, 15, 31, 45, and 50 stand rejected under 35 U.S.C. § 112, ¶ 1, as allegedly failing to comply with the written description requirement. This rejection is respectfully traversed.

Nevertheless, without conceding the propriety of the rejection and in the interest of expediting allowance of the application, claims 1, 15, 31, and 45 are amended to recite, in part, *"unstructured service requests log."* Accordingly, as agreed during the interview, claims 1, 15, 31, and 45 as amended overcome the §112 rejection. Support for this amendment is found at least in paragraph 0025 of the application as originally filed. There is no new matter.

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, claim 50 is amended and does not recite "historic problem cause and resolution data." Thus, the rejection is now moot.

Applicant respectfully requests withdrawal of the §112 first paragraph rejections.

§ 101 REJECTIONS

Claims 45 and 47-49 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant respectfully traverses the rejection.

Nevertheless, without conceding the propriety of the rejection and in the interest of expediting allowance of the application, claim 45 is amended along the lines discussed during the interview to recite, in part, *"A computing device comprising: **means for processing; means for storing** computer-program instructions executable by the processing means, wherein the instructions, when executed enable:…"*. Applicant asserts

that the claim as amended recite a device with tangible components, and thus, complies with the statutory requirements of 35 U.S.C. §101. Support for this amendment is found at least in Fig. 5 of the application as originally filed. There is no new matter.

Claims 47-49 depend from independent claim 45 and are directed to statutory subject matter by virtue of depending from a base claim directed to statutory subject matter.

Accordingly, Applicant respectfully requests withdrawal of the §101 rejections.

§ 102 REJECTIONS

Claims 1, 3-6, 9-12, 15, 17-20, 23-26, 29-31, 33-36, 39-42, 45, 47-50, and 52-53 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,224,206 (Simoudis). Applicant respectfully traverses the rejection.

<u>Claim 1</u>

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claim 1 to clarify further features of the subject matter.

Independent claim 1 recites a computer-implemented method comprising:

> executing computer-readable instructions with a processor that, when executed, direct a computing device to perform the acts of:
> *extracting metadata* from the text of an unstructured service requests log of end-user and product support engineer communications, wherein *the metadata comprise at least one of a product name, a symptom, a cause, a resolution, a problem diagnosis question, or a link to a product support article*;
> *aligning at least one of the product name, the symptom, the cause, the resolution, the problem diagnosis question, or the link to the product support article from*

the metadata to form one or more structured answer objects, wherein one structured answer object is formed from one unstructured service request log;

clustering the one or more structured answer objects into semantic clusters, wherein the semantic clusters are reinforced by cross referencing the one or more structured answer objects based a link feature to a same product support article, the link feature arranged in a separate layer than a content of the one or more structured answer objects and the cross referencing creating an inter-layer link between the one or more structured answer objects and the same product support article;

identifying a set of the one or more structured answer objects based on the semantic clusters, wherein each structured answer object in the set comprises at least one of a term or a phrase-related to a symptom description; and

providing problem diagnosis data from the set of the one or more structured answer objects to the user, wherein the problem diagnosis data comprises a one or more symptom description data fields, a one or more cause description data fields, and a one or more resolution description data fields *organized into a hierarchical tree structure such that each symptom description data field is a parent node of a one or more of the cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields.*

Applicant respectfully submits that no such method is disclosed by Simoudis.

Simoudis is directed to "a case retrieval system which performs an initial retrieval of cases from a case library based upon the surface features or symptoms of a problem. However, the present invention [Simoudis] examines this set of retrieved cases to determine whether each case is justifiably relevant to the problem" (column 2, lines 59-62). Simoudis discusses "a need for a case-based reasoning system in which only cases that are justifiably relevant are retrieved and presented to a case reasoner and ultimately the user of the system" (column 2, lines 32-35). This need exists because "[a] human user should be presented with cases that are justifiably relevant in order to reduce the

amount of time needed to solve a new problem presented to the system" (Simoudis, column 2, lines 25-28).

In contrast, Applicant's application discloses a "troubleshooting wizard 120 to allow an end-user of the client computer 106 to systematically present and leverage hierarchically structured historical product problem diagnosis data from structured answer data objects 110 in view of a given product problem symptom or description" (paragraph 0036). The structured answer objects (SAOs) are created by a "SAO generation module 124 [that] aligns related symptom(s), results(s), cause(s), resolution(s), question/answer pairs, related KB articles, and so on, from the metadata 126 to form structured answer objects 110" (Application, paragraph 0027). "The troubleshooting wizard 120 leverages the internal data representation of the SAO(s) 110 embedded in response 118 to present each symptom, cause, and resolution data set in a respective hierarchical tree structure. In this tree, each symptom parent node has one or more cause child nodes. Each cause node, in turn, is a parent node for one or more resolution child nodes" (Application, paragraph 0039).

Simoudis discusses that "a case is a database entry that includes the symptoms of the problem, the cause of a problem, and a solution to the problem. When a new problem is presented to the system 10, the information (or symptoms) relating to the new problem is input into a case retriever 14. The new problem is examined by the case retriever 14 in order to determine the most important features of the new problem. Using these most important features, the case retriever 14 queries the case library and retrieves cases that are initially deemed appropriate to the new problem" (column 3, lines 29-40).

However, Simoudis does not disclose *"extracting metadata ... wherein the metadata comprise at least one of a product name, a symptom, a cause, a resolution, a problem diagnosis question, or a link to a product support article;* [and] *aligning at least one of the product name, the symptom, the cause, the resolution, the problem diagnosis question, or the link to the product support article from the metadata to form one or more structured answer objects,"* as recited in Applicant's amended claim 1. Applicant has searched and failed to find any disclosure in Simoudis of a structured answer object created from aligning elements of extracted metadata. MSN Encarta Dictionary defines "align" as "bring something into line: to place something in a straight line or **in an orderly position in relation to something else,** or be placed in this way" (available at http://encarta.msn.com/dictionary_/align.html; emphasis added).

The Office states, and Applicant agrees, that "Simoudis does not teach ... clustering respective ones of the structured answer objects based on the index to group related structured answer objects" (Office Action, page 33). Accordingly, Simoudis also fails to disclose *"clustering the one or more structured answer objects into semantic clusters, wherein the semantic clusters are reinforced by cross referencing the one or more structured answer objects based a link feature to a same product support article, the link feature arranged in a separate layer than a content of the one or more structured answer objects and the cross referencing creating an inter-layer link between the one or more structured answer objects and the same product support article,"* as recited in Applicant's amended claim 1.

The Office asserts that "'a case is a database entry that includes the symptoms of the problem, the cause of a problem, and a solution to the problem,' where the claimed

'resolution' is the referenced 'solution to the problem,' and where the **results are hierarchical** because a symptom must have a cause which must have a solution" (Office Action, page 9; emphasis). Webopedia defines "hierarchical" as referring"…to systems that are organized in the shape of a pyramid, with each row of objects linked to objects directly beneath it. Hierarchical systems pervade everyday life. The army, for example, which has generals at the top of the pyramid and privates at the bottom, is a hierarchical system. Similarly, the system for classifying plants and animals according to species, family, genus, and so on, is also hierarchical" (available at http://webopedia.com/TERM/H/hierarchical.html).

Applicant understands the Office to acknowledge that Simoudis does not explicitly disclose a parent-child node relationship or a hierarchy. However, it is unclear as to if the Office is asserting that "the results are hierarchical" based on inherency, official notice, or another rational. Applicant respectfully requests clarification for this ground of rejection.

Simoudis discusses address the problem of "a large number of non-justifiably relevant cases" (column 2, lines 29-30) by a process for "rejection of a retrieved case because it is not relevant" (column 3, lines 65-66). Whereas Applicant's disclosure gives users "directed organized interaction with the historical problem diagnosis data" (paragraph 0040) in an interface such as shown in Fig. 2. Presenting the "right" solution to a user is done differently by Simoudis and Applicant. Accordingly, Simoudis does not disclose "*data fields **organized into a hierarchical tree structure such that each symptom description data field is a parent node of a one or more of the cause***

description data fields, and each cause description," as recited in Applicant's amended claim 1.

Simoudis fails to disclose each and every feature of Applicant's amended claim 1 for all the above reasons. Accordingly, Applicant respectfully requests withdrawal of the § 102 rejection.

Claim 9

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claim 9 to clarify further features of the subject matter.

Independent claim 9 recites a method at least partially implemented by a computing device comprising:

> executing computer-readable instructions with a processor that, when executed, direct a computing device to perform the acts of:
> communicating, by a troubleshooting wizard, a search request comprising a product problem description of a problem with a product generated from an input by a user of the troubleshooting wizard to a server computing device, wherein the input comprises a text-based symptom description and identification of the product;
> receiving a response from the server computing device, the response comprising information obtained from an unstructured service requests log of end-user and product support engineer communications; and
> responsive to receiving the response to the search request, presenting, by the troubleshooting wizard, the information from the response to the user, wherein the information comprises symptoms, causes, and resolutions from the unstructured service requests log of end-user and product support engineer communications and the *information is organized into a hierarchical tree structure such that a symptom description data field is a parent node of a one or more cause description data fields, and*

> *each cause description data field is a parent node of a one or more resolution description data fields*, wherein the text-based symptom description and identification of a product provided by the user correspond to the symptom description data field.

Applicant respectfully submits that no such method is disclosed by Simoudis.

For at least the reasons asserted above with respect to Applicant's claim 1, Simoudis does not disclose "*information [that] is organized into a hierarchical tree structure such that a symptom description data field is a parent node of a one or more cause description data fields, and each cause description data field is a parent node of a one or more resolution description data fields*," as recited in Applicant's amended claim 9. Of all the possible ways to structure information regarding symptoms, causes, and resolutions, Simoudis does not disclose the way recited in Applicant's claims.

As Simoudis fails to disclose each and every feature of Applicant's amended claim 9, Simoudis does not anticipate claim 9. Accordingly, Applicant respectfully requests withdrawal of the §102 rejection.

Claims 23, 39, and 50

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claims 23, 39, and 50 similar to independent claim 9. Claims 23, 39, and 50 are allowable for the same reasons as asserted above with respect to claim 9. Accordingly, Applicant respectfully requests withdrawal of the §102 rejections.

Claim 15

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claim 15 to clarify further features of the subject matter.

Independent claim 15 recites a computer-readable storage medium comprising computer-executable instructions for:

> *converting, by a computing device, unstructured service requests log of an end-user and a product support engineer communications to one or more structured answer objects*, wherein each unstructured service request comprises–product problem information, product problem cause information, and product problem resolution information and each structured answer object corresponds to a single unstructured service request and the *structured answer object represents the product problem information, the product problem cause information, and the product problem resolution information in a one-problem-one-cause-one-solution structure*;
> receiving, from a client computing device, a product problem description;
> identifying a set of the structured answer objects, each structured answer object in the set comprising terms and phrases related to the product problem description;
> *generating semantic clusters from the set of structured answer objects based on content and link features of the structured answer objects by using a two-ways k-means mutual reinforcement clustering algorithm to iteratively cluster each structured answer object to a lower dimensional feature space*, wherein the semantic clusters represent product problem information, product problem cause information, and product problem resolution *information from a plurality of unstructured service requests logs in a hierarchical one-problem-to-multiple-cause-multiple-solution structure*; and
> providing problem diagnosis data comprising the product problem cause information, and the product problem resolution information from the semantic clusters to an end-user for product problem diagnosis.

Applicant respectfully submits that no such computer-readable storage medium is disclosed by Simoudis.

Simoudis discusses "a case [that] is a database entry that includes the symptoms of the problem, the cause of a problem, and a solution to the problem" (column 3, lines 30-32). Simoudis additionally discusses "a collection of cases from the case library" (column 7, lines 10-11). However, Simoudis fails to disclose "*converting, by a computing device, **unstructured service requests log of an end-user and a product support engineer communications to one or more structured answer objects** ... [that] **represents** the product problem information, the product problem cause information, and the product problem resolution **information in a one-problem-one-cause-one-solution structure**,*" as recited in Applicant's amended claim 15. Simoudis appears to <u>start</u> with a case and <u>end</u> with a case library without any converting or other intermediate processing.

The Office states, and Applicant agrees, that "Simoudis does not teach ... clustering respective ones of the structured answer objects based on the index to group related structured answer objects" (Office Action, page 33). Accordingly, Simoudis also fails to disclose "***generating semantic clusters** from the set of structured answer objects based on content and link features of the structured answer objects **by using a two-ways k-means mutual reinforcement clustering algorithm** to iteratively cluster each structured answer object to a lower dimensional feature space,*" as recited in Applicant's amended claim 15.

Simoudis discusses "cases in the retrieved set" (column 12, lines 20-56). However, Applicant has searched and failed to find any disclosure in Simoudis of "*information from a plurality of unstructured service requests logs in **a hierarchical one-***

problem-to-multiple-cause-multiple-solution structure," as recited in Applicant's amended claim 15.

As Simoudis fails to disclose each and every feature of Applicant's amended claim 15, Simoudis does not anticipate claim 15. Accordingly, Applicant respectfully requests withdrawal of the §102 rejection.

Claims 31 and 45

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claims 31 and 45 similar to independent claim 15. Claims 23 and 39 are allowable for the same reasons as asserted above with respect to claim 15. Accordingly, Applicant respectfully requests withdrawal of the §102 rejections.

Claim 29

Without conceding the propriety of the rejection and in the interest of expediting allowance of the application, Applicant amends independent claim 29 to clarify further features of the subject matter.

Independent claim 29 recites a computer-readable storage medium comprising a structured answer object data structure for use in product problem analysis and diagnosis, the structured answer object data structure comprising:

> a product problem description data field;
> a product problem cause data field; and
> a product problem resolution data field;
> *wherein data fields are organized into a hierarchical*
> *tree structure such that the product problem description*
> *data field is a parent node of a one or more of the product*

*problem cause data fields, and each product problem
cause data field is a parent node of a one or more of the
product problem resolution data fields.*

Applicant respectfully submits that no such computer-readable storage medium is disclosed by Simoudis.

For at least the reasons asserted above with respect to Applicant's claim 1, Simoudis does not disclose "*data fields [that] are organized into **a hierarchical tree structure such that the product problem description data field is a parent node of a one or more of the product problem cause data fields, and each product problem cause description data field is a parent node of a one or more of the product problem resolution description data fields***," as recited in Applicant's amended claim 29.

As Simoudis fails to disclose each and every feature of Applicant's amended claim 29, Simoudis does not anticipate claim 29. Accordingly, Applicant respectfully requests withdrawal of the §102 rejection.

Claims 3-6, 10-12, 17-20, 24-26, 30-31, 33-36, 40-42, 47-49, and 52-53

Applicant cancels **dependent claims 6, 10, and 40** without prejudice, waiver, or disclaimer of the subject matter, and thus, the rejections are now moot.

Dependent claims 3-5, 11-12, 17-20, 24-26, 30-31, 33-36, 41-42, 47-49, and 52-53, depend directly or indirectly from one of independent claims 1, 9, 15, 23, 29, 31, 39, 45, and 50, respectively, and thus, are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in claims 1, 9, 15, 23, 29, 31, 39, 45, and 50 are not disclosed by Simoudis.

Applicant respectfully requests withdrawal of the §102 rejections.

§ 103 REJECTIONS

Claims 7-8, 13-14, 21-22, 27-28, 37-38, 43-44, and 54 stand rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,224,206 (Simoudis) in view of U.S. Patent No. 5,819,258 (Vaithyanathan). Applicant respectfully traverses the rejection.

Applicant cancels **dependent claims 7 and 8** without prejudice, waiver, or disclaimer of the subject matter, and thus, the rejections are now moot.

Dependent claims 13-14, 21-22, 27-28, 37-38, 43-44, and 54, depend directly or indirectly from one of independent claims 9, 15, 23, 31, 39, and 50, respectively, and thus, are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features that, in combination with those recited in claims 9, 15, 23, 31, 39, and 50 are not disclosed, taught, or suggested by Simoudis and Vaithyanathan.

As one example, **dependent claim 13** is amended to recite, in part, "*wherein respective ones of the structured answer objects are clustered by the server computing device as corresponding to one another, the **clustering being based on: obtaining clustering information from separate types of objects that are arranged in separate layers, wherein each separate layer comprises a homogenous type of objects; and iteratively projecting and propagating the clustering information until the clustering converges*.*"

Vaithyanathan discusses "a cluster or group of documents" (column 6, lines 1-2) and applying the teachings of Vaithyanathan to "an Internet web page directory service" (column 5, lines 10-11). However, Vaithyanathan does not mention links between web pages or clustering any objects other than "documents." Accordingly, Vaithyanathan does not teach, disclose, or suggest "*clustering being based on: obtaining clustering information from **separate types of objects that are arranged in separate layers**,*" as recited in Applicant's amended claim 13.

Vaithyanathan discusses that "[w]hen the inventive method is applied to the root cluster, a first level of sub-clusters is generated" (column 6, lines 4-6). However, Vaithyanathan does not disclose, teach, or suggest generating clusters by "***iteratively projecting and propagating the clustering information until the clustering converges***," as recited in Applicant's amended claim 13.

Simoudis fails to compensate for the above deficiencies in Vaithyanathan. Accordingly, Vaithyanathan and Simoudis fail to disclose, teach, or suggest Applicant's amended claim 13.

As a second example, **dependent claim 14** is amended to recite, in part, "*wherein the clustering is further based on unified clustering operations, wherein the **unified clustering operations provide additional clustering analysis generated by a human being**.*"

Vaithyanathan discusses "manual clustering. In this method, the categories are manually selected for each body of documents and each document is examined by a human being who places the document into one of the categories" (column 2, lines 50-54). However, Vaithyanathan does not disclose, teach or suggest "*unified clustering*

*operations provide **additional** clustering analysis **generated by a human being**,*" as recited in Applicant's amended claim 14.

Simoudis fails to compensate for the above deficiencies in Vaithyanathan. Accordingly, Vaithyanathan and Simoudis fail to disclose, teach, or suggest Applicant's amended claim 14.

For all the above reasons, Applicant respectfully requests withdrawal of the §103 rejections of dependent claims 13-14, 21-22, 27-28, 37-38, 43-44, and 54.

CONCLUSION

For at least the foregoing reasons, claims 1, 3-5, 9, 11-15, 17-31, 33-39, 41-45, 47-50, 52-54 are in condition for allowance. Applicant respectfully requests reconsideration and withdrawal of the rejections and an early notice of allowance.

If any issue remains unresolved that would prevent allowance of this case, Applicant requests that the Examiner contact the undersigned attorney to resolve the issue.

Respectfully submitted,

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